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ABSTRACT

This paper describes the development and evaluation of a World Wide Web-based component for a required freshman seminar at the Pennsylvania State University College of Agricultural Sciences. Students (n=170) were given a pre-test to assess their access to, knowledge of, and proficiency with computers. The pre-test was designed to address four broad categories: computer use, ability, and perceptions; Internet perceptions and use; communication preferences; and demographic information. This formative evaluation assessed student needs and helped the project team to continue to develop course content for the semester. A summative evaluation was given at the end of the semester to ascertain students' perceptions of web-based assignments and needed changes for future courses. In addition, one faculty member from each section participated in a phone survey, answering questions about their experiences with the course. It was concluded that using a computer-based asynchronous teaching model is quite different from the more traditional model and requires special considerations; practitioners should incorporate formative and summative evaluations to enhance learner satisfaction, to ensure goal attainment, and to demonstrate accountability. (DLS)

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Evaluating for Distance Learning: Feedback From Students and Faculty

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Distance learning methodologies support a wide variety of academic programs for residential and off-campus students. These delivery technologies, including audio and video teleconferencing, computer conferencing, and web-based instruction are changing the way students interact with subject matter and faculty. In addition to enhancing traditional learning practices, distance learning technologies affect how students engage the global community through on-line resources. Internet site design and user compatibility provide a starting point to integrate computers into instruction.

Web-based instruction, for example, is growing faster that any other instructional technology (Crossman, 1997). With a computer connection, students and faculty use the web to exchange information and access resources from around the world. The popularity of web-based instruction is attributed to its convenience and flexibility of access (Daugherty and Funke, 1998).

The innovative nature of distance education methodologies demands close examination regarding the issues and practices relevant to educational quality and integrity. Reeves and Reeves (1997) concluded that there are many issues relevant to the web that have to be fully investigated for their pedagogical soundness. Web resources are viewed as a means by which to keep courses current, however, accuracy and timeliness plague sites that are not regularly updated.

While some faculty embrace the challenge to incorporate new technologies into the learning environment, others are overwhelmed by them (Collis, 1993). Dillon and Walsh (1992) found that faculty involved in distance education acquire more positive attitudes as their experience with distance education increase. Herther (1997) suggests that the quality of learning through distance education be evaluated before web-based instruction is subsumed and adopted into university practices.

Evaluation is an integral part of course delivery and development. Cost-benefit, learner satisfaction, goal attainment, and accountability require faculty to gather and submit feedback on the effectiveness of course process and content. Evaluation studies provide timely feedback and constructive criticism to the developers and designers using information technology while the curriculum is still evolving (Collis, 1993). Positive evaluations encourage administrative support of policies, practices, and infrastructure relevant to distance education. Furthermore, insights gained broaden faculty understanding of the commitments necessary to develop quality programs that enhance the traditional learning environment.

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Collis (1993) suggests that distance education projects are marginally evaluated. Furthermore, when they are evaluated, the evaluations focus on either client satisfaction or factors correlated with learner persistence or attrition. This paper focuses on participants' feedback about the content and relevance of web-based instruction. Students and faculty were queried about product and process. The importance of faculty and learner feedback in furthering the distance education mission is stressed. Formative evaluations were used to provide information about improving the course. Summative evaluation were carried out to make judgments about the basic worth of incorporating web-based technology into the freshmen seminar.

Integrating Distance Education Technologies

Beginning fall 1999, the Pennsylvania State University will require all entering students to take a freshmen seminar. The purpose of the seminars is to support the transition of students to the University environment. Penn State's College of Agricultural Sciences offers *Be a Master Student!* (AG 150) as a two-credit course to entering freshmen. The course focuses on 1) facilitating the student's transition to the university community, and 2) increasing each student's understanding of the issues and opportunities in the agricultural sciences.

To address an identified need, a web-based component was added to the AG 150 curriculum in fall 1997. The intent was to use communications technology to enhance the agricultural sciences component of the curriculum, making the course available to Penn State students and non-students throughout the Commonwealth. The goal was 1) to develop web-based resources that would facilitate the exploration of current issues in the agricultural sciences and their associated resources at Penn State, and 2) to develop a series of activities or lesson plans for students and faculty teaching AG 150 to integrate into the curriculum.

Before this project, computer-based instruction was not available to faculty teaching AG 150. The website supplements the classroom experience by providing a solid core of common resources across sections and campuses as well as the opportunity for students and instructors to interact electronically outside of class. In addition, faculty could draw course assignments from a plethora of web-based resources.

Project Development

Technology-based instruction requires much planning and collaboration. Integration of technology resources for AG 150 was a complex task. It required the synergy and patience of faculty, support staff, and students. The website developed to supplement instruction in the College's freshmen seminar was not created by faculty currently teaching the course. Two faculty members from the College of Agricultural Sciences team taught each of the nine sections. Faculty, often independent and accustomed to teaching autonomously, were required to work in teams to collaboratively develop course materials. Thus, it was imperative that tools and other opportunities be developed to demonstrate to the teaching faculty how the site could support their instructional objectives.

Web-based instruction is a relatively new methodology in higher education, and many issues still need to be addressed. Lack of faculty incentives, limited access to technology, and insignificant support can hinder successful delivery (Bowen and Thomson, 1994). Lessons learned through formative and summative evaluations of the instructional technology

portion of the AG 150 seminar provide a road map for faculty pursuing web-based instruction.

Because the University has made the freshmen seminar a requirement, AG 150 has become a model for other colleges to follow. This prototype includes among other things—World Wide Web-based instruction with virtual tours, career path designs, faculty interviews, and links to many relevant resources on the Internet. The site http://www.cas.psu.edu/docs/CASOVER/AG150.index.htm is relevant to anyone interested in agricultural issues.

Evaluation Process

To test the goals for the project and to learn even more about this new learning approach, it was agreed from the outset to collect as much data as reasonable. The population for the study was all of the students in AG 150 *Be a Master Student!* during fall semester, 1997. Because the number of students in AG 150 was small ($N = 170$), a census was used. Students were given a pre-test at the beginning of the semester to assess their access to, knowledge of, and proficiency with computers. The pre-test instrument used was designed to address four broad categories: 1) computer use, ability, and perceptions; 2) Internet perceptions and use; 3) communication preferences; and 4) demographic information. The formative evaluation assessed student needs and helped the project team continue to develop course content for the semester.

During the semester, faculty used the web-site to supplement in-class lectures and provide resources for assignments. Three of the nine sections specifically used the AG 150 web site. One instructor maximized the AG 150 site by using it in another course. Instructors indicated that helping students determine how to evaluate the credibility of web-based resources now needed to be incorporated into their instruction.

A summative evaluation was given at the end of the semester to ascertain students' perceptions of web-based assignments and needed changes for future courses. Students were queried on using the Web for AG 150 and other courses. Among the 170 students registered, 142 usable, completed post-test questionnaires were collected, an 84% response rate. One of the faculty members from each section participated in a phone survey, answering questions about their experiences with the course.

Findings

The formative evaluation queried students about course content, expectations, and use of the World Wide Web. The survey findings indicated that generally, freshmen access to and knowledge of computers is increasingly. Of the 142 students who were surveyed during fall 1996, 57% owned computers. Among those who owned their computers, 46% ($n = 66$) indicated that their computers were connected to the Internet. Among the two-thirds ($n = 108$) who owned their computers in fall 1997, 72% indicated that their computers were connected to the Internet. Also fall 1997, three-quarters of the students (74.6%) responded that they were already using computers at least once a day. Almost half of the students (45%) stated that they used the Web for class assignments. Forty-four percent indicated that a course that required a web-based supplement appealed to them. The students also indicated interest in learning about job opportunities, internships, and University resources.

In response to student surveys, faculty integrated additional content on career opportunities into the course before the semester's end.

The summative evaluation addressed learner satisfaction with the technology. When asked what they liked most about using the Web, two-thirds ($n = 93$) of the students expressed that they liked its convenience and wealth of information. Typical reasons students gave for using the Web:

- "It's easy to get a lot of information without leaving home."
- "It's a hands-on approach to learning."
- "I think it is important to be able to use the Web, because it is such a prevalent means of communication."

In addition, students expressed a concern regarding the reliability of web-based information. When prompted about the accuracy of web-based information, 57% of the 142 students indicated that they considered the source to determine if information is credible.

This freshmen seminar is one of many projects to integrate distance education technologies into University curricula. In every section, students were expected to submit at least some, if not all, assignments via e-mail. The results indicated that students who do not own personal computers must be considered when designing technology-based instruction. Instructors consistently commented on the increasing computer literacy among students during the past two years. Specifically noted was that students with the fewest computer skills were non-University Park (main) campus based. Faculty involved in recruitment for the College in addition to the freshmen seminar recognized the Web's potential as a recruitment tool among secondary students as well as among those in higher education who are outside the agricultural sciences. For the site to be used in this way, faculty noted that placement on the College's homepage becomes crucial.

Conclusion

The project revealed that using a computer-based, asynchronous teaching model is quite different from the more traditional model and requires special considerations. Although entering freshmen are expected to be increasingly computer literate, students enter the university with varying levels of expertise. To optimize the students' educational experiences, faculty will need to be aware of the competencies students bring in order to maximize their learning opportunities.

Furthermore, it is important to note that access to technology is not a significant incentive for faculty to embrace new teaching methodologies. Relevance to subject matter, timeliness of information, and facilitation of instructional objectives are required for successful integration of web-based resources.

While many students enter the university with Internet experience, some faculty are still learning how to incorporate instructional technologies into learning opportunities. Faculty need administrative support and opportunities to develop effective technology-based courses. Faculty must openly communicate with students and each other throughout the learning experience to develop curricula that effectively use distance education technologies. Web-based information is easily accessible and convenient, however, its reliability and accuracy can be questionable. Faculty that incorporate web-based instruction into the

curriculum should develop ways for students to test the accuracy of information found on the web.

The evaluation process is key in the communications process. Identifying relevant issues and problems during the course provides opportunities to develop solutions for quality educational programs. Student feedback during the learning process helps to shape the course and improve the learning experience. Practitioners that seek to integrate distance education methodologies into existing curriculum should incorporate formative and summative evaluations to enhance learner satisfaction, to ensure goal attainment, and to demonstrate accountability.

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Autobiographical Sketches

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